DOCUMENT RESUME

ED 455 216 SP 040 141

TITLE	Implementing the Recommended High School Program as the Minimum Graduation Requirement: A Study of the Need for Teachers.
INSTITUTION	Texas Education Agency, Austin.; Texas State Board for Educator Certification, Austin.
PUB DATE	2001-01-00
NOTE	33p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Beginning Teacher Induction; Distance Education; *Graduation; Higher Education; Preservice Teacher Education; Secondary School Teachers; *Teacher Certification; *Teacher Supply and Demand
IDENTIFIERS	*Texas

ABSTRACT

This report describes a recommended high school program which requires that students take specific courses for graduation, including credits in the core subject areas, in foreign languages, and in other areas. One relevant issue of concern is the availability of certified teachers in specific subject areas. The report focuses on: current course requirements and graduation plans; projected areas of most need; review of certification requirements; projected need for teachers in specific subject areas: Public Education Information Management System (PEIMS) data analysis; projected need for teachers in specific subject areas: Texas A&M survey; cost estimates; available and projected certified teachers; production, employment, and attrition; employed teachers who are uncertified; projected production needed; efforts to address shortages; Texas Beginning Educator Support System; distance learning and dual credit; other significant issues related to this study; and strategies to address teacher need. Nine appendixes present course requirements at the secondary level; Texas state graduation requirements; campuses not offering the recommended high school program, 1999-00; number of students completing the course, 1999-00; assumptions and related notes; related nonrequired courses; excerpt from Regional Teacher Supply and Demand Study, 1999-00; course completions through distance learning, PEIMS 1999-00; and course completions through dual credit, PEIMS 1999-00. (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 455 216

Implementing the Recommended High School Program as the Minimum Graduation Requirement

A Study of the Need for Teachers

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
L. Kemp
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
1

Prepared by the
Texas Education Agency *and*
State Board for Educator Certification

for the K-16 Council

January 2001

BEST COPY AVAILABLE

SP040141

Implementing the Recommended High School Program as the Minimum Graduation Requirement

A Study of the Need for Teachers

Texas Education Agency
Department of Curriculum, Assessment, and Technology
1701 North Congress Avenue
Austin, Texas 78701-1494
512 463 9087
www.tea.state.tx.us

State Board for Educator Certification
1001 Trinity Street
Austin, Texas 78701-2603
512 463 3000
www.sbec.state.tx.us

January 2001

Implementing the Recommended High School Program as the Minimum Graduation Requirement

A Study of the Need for Teachers

Summary

- Since 1995 the percentage of students graduating under the Recommended High School Program has increased by 13%, and 41% of the Class of 1999 graduated under programs that were more rigorous than the Minimum Graduation Plan. Approximately half (55%) of the Class of 1999 graduated under the Minimum Graduation Plan.

- Consideration is being given to requiring the Recommended High School Program as the minimum graduation plan. In comparison to the minimum plan currently in place, the Recommended High School Program requires an additional course in mathematics and additional credits in science, social studies, languages other than English, and fine arts.

- It is estimated that about 2,750 FTEs would be needed annually to teach each of the required areas of mathematics, science, and languages other than English, which were examined in this study.

- The study indicates that the educator preparation programs in Texas are currently unable to supply the needed numbers of teachers in critical fields. In several of the shortage areas, almost as many new teachers were recruited from out of state as were produced in Texas.

- Of each year's supply of newly certified teachers, approximately 66% actually enter Texas classrooms the following school year. Almost 75% of new teachers, however, will eventually teach at least 1 year within 4 years of becoming certified. It is incumbent upon Texas educator preparation programs to expand teacher recruitment efforts exponentially to meet both the current and projected needs for certified teachers.

Implementing the Recommended High School Program as the Minimum Graduation Requirement

A Study of the Need for Teachers

Introduction

A voluntary recommended high school program was first adopted by the State Board of Education in November 1993. This 24-credit program, developed with input from educators, business leaders, and the public, encourages students, parents, and campuses to set goals beyond the minimum graduation requirements. Between 1993 and 2000 the State Board of Education codified the Recommended High School Program into rule with minor changes in course requirements. The Recommended High School Program requires that students take specific courses for graduation including credits in the core subject areas: English language arts and reading, mathematics, science, and social studies. Credits in languages other than English and other courses are also required.

Discussion is occurring about whether the Minimum Graduation Plan should be eliminated (or become the exception) and all students be required to complete at least the Recommended High School Program. In light of increasingly rigorous statewide testing requirements and demanding college curricula, requiring the Recommended High School Program for graduation would provide students with more rigorous and in-depth courses of study to better prepare them for higher education and, ultimately, for participation in a competitive global economy.

Should this change be implemented, one issue to be addressed is the availability of certified teachers in specific subject areas, particularly in mathematics, sciences, and languages other than English. If all students are required to take the Recommended High School Program for graduation, it is critical that there be enough certified teachers available in each school district to teach the required courses. The state is already investigating and implementing new strategies to attract, train, and retain growing numbers of teachers in order to meet increasing demand. For example, one strategy focuses on recruiting higher numbers of mid-career professionals into teaching and providing them with temporary credentials while they work toward standard certification. In addition, the Texas Beginning Educator Support System (TxBESS) is in its second year of development and is expected to decrease attrition rates significantly. TxBESS provides structured support and mentoring for newly certified teachers to foster their professional growth and to encourage them to remain in the profession.

Current Course Requirements and Graduation Plans

As required by Texas Education Code §28.002, each school district that offers grades 9 through 12 must provide instruction in the foundation curriculum consisting of English language arts, mathematics, science, and social studies (Texas, United States, and world history; government; and geography) and in the enrichment curriculum consisting of languages other than English (to the extent possible), health, physical education, fine arts, economics (with emphasis on the free enterprise system and its benefits), career and technology education, and technology applications. State Board of Education rules enumerate the courses that school districts must offer as shown in Appendix 1.

As required by statute, the State Board of Education has established three graduation plans from which students choose: the Minimum Graduation Plan, the Recommended High School Program, and the Distinguished Achievement Program. Appendix 2 provides a side-by-side comparison of the specific requirements of each of these graduation programs. Compared to the 22 credits comprising the minimum plan, 24 credits are required in the Recommended High School Program, including another prescribed course in mathematics and additional credits in science, social studies, languages other than English, and fine arts. Fewer credits in elective courses are necessary in the Recommended High School Program than in the minimum plan.

Since its implementation, the percent of students completing the Recommended High School Program has increased, particularly as previous graduation plans such as the Advanced and Advanced with Honors programs have been phased out. The Class of 1999 was the last to use the Advanced and Advanced with Honors programs for graduation. The percent of students graduating under the Recommended High School Program is expected to continue increasing; data for the Class of 2000 should be available by early March 2001.

Table 1. Students Graduating Under High School Programs Beyond the Minimum Program

Class of	Recommended High School Program	Distinguished Achievement Program	Advanced Program	Advanced with Honors Program	Total
1999	13.6%	1.4%	14.1%	12.1%	41.2%
1998	8%	0.66%	16.2%	14.6%	39.5%
1997	1.3%	0.05%	19.9%	19.4%	40.7%
1996	0.38%	0.09%	20.4%	19.7%	40.6%
1995	0.17%	0.1%	20.7%	18.6%	39.57%

Many school districts provide the courses for the Recommended High School Program on site at the campus. Other districts are offering this program through a variety of means: concurrent enrollment arrangements with neighboring districts, affiliation agreements with community and junior colleges, distance learning opportunities, or correspondence courses through universities. Texas Education Code §56.304(g) requires that, by March of each year, the Texas Education Agency (TEA) provide to The Texas Higher Education Coordinating Board a list of high school campuses whose students do not have the opportunity to complete either the Recommended High School Program or the Distinguished Achievement Program (See Appendix 3.). In June and October 2000, TEA conducted further investigation to follow up on the campuses not offering the Recommended High School Program. Twenty alternative campuses and 1 regular instructional campus indicated that they only offer the 22-credit Minimum Graduation Plan. The regular instructional campus is also anomalous in that it provides its instruction through correspondence courses.

Additional information on student access to the Recommended High School Program for school year 2000-2001 will be reported to TEA by districts and will be available in February 2001.

Projected Areas of Most Need

It is anticipated that the availability of teachers will be more problematic for some courses if the Recommended High School Program is the mandatory minimum. This study looks at the courses for which this change will likely pose the most severe difficulties. Specifically, the courses examined are Algebra II, Integrated Physics and Chemistry (IPC), Chemistry, Physics, and several languages other than English. The languages are Spanish, French, and German, which are the courses most

commonly taken currently by students in Texas high schools. Appendix 4 provides 1999-2000 course completion data for the courses used in this study, including completions by grade level.

The three sciences listed above are included in this study because, in addition to mandating a course in biology, the Recommended High School Program requires two other science credits. Students may choose these credits from IPC, chemistry, or physics. (The College Board Advanced Placement and International Baccalaureate courses may be substituted where appropriate, and students may also take Principles of Technology I in lieu of Physics.)

Table 2. Ways to Achieve the Three Required Science Credits

	IPC	IPC
Biology	Biology	Biology
Chemistry	Chemistry	
Physics		Physics

Review of Certification Requirements

The State Board for Educator Certification (SBEC) is responsible for ensuring that persons are qualified to serve in the public school system through the state's certification process. SBEC adopts rules for certification requirements for classroom teachers and specifies requirements for assignment of teachers and other public school personnel. The assignment requirements are delineated in 19 Texas Administrative Code (TAC) Chapter 230 Subchapter U, Assignment of Public School Personnel.

Current certificate requirements for grades 9 through 12 course assignments (junior high, high school, or all level assignments) are shown in Table 3.

Table 3. Certificate Requirements

Assignment	Certificate
Mathematics (Algebra I, Algebra II, and Geometry)	Mathematics
Biology	Biology Science Composite
Chemistry	Chemistry Science Composite
Physics	Physics Science Composite
Integrated Physics and Chemistry (IPC)	Physical Science Chemistry Physics Science Composite
Languages Other than English, Levels I and II	Teaching Field in Language of Assignment

Projected Need for Teachers in Specific Subject Areas: PEIMS Data Analysis

Public Education Information Management System (PEIMS) data for 1999-2000 were analyzed by TEA and used to develop projections for additional numbers of teachers needed for the Recommended High School Program should it become the required minimum program. The earliest possible implementation date for the Recommended High School Program as mandatory for graduation was assumed to be the 2002-2003 school year, with ninth-grade students taking the required courses over a four-year period. The projected numbers of teachers needed in specific required subject areas are also based on other assumptions related to numbers of students per grade, numbers of students per classroom, and numbers of educators certified in the specific areas. These assumptions include a cohort of approximately 300,000 students, an average class size of 20 students, and an average teaching load of 5.5 sections per full-time equivalent (FTE). Given these assumptions, it is estimated that about 2,750 additional FTEs would be needed annually to teach each of the required areas addressed in this study. Another key assumption is that the FTEs teaching a specific course are appropriately certified or hold permits to teach that course. More detail about the assumptions used for this analysis can be found in Appendix 5.

Table 4 illustrates the additional demand for teaching staff in required courses in the three areas of mathematics, science, and languages other than English, given an estimated increase in course completions required for the Recommended High School Program. Four scenarios are depicted in Table 4 based on possible reallocation of teachers. FTEs teaching nonrequired (elective) courses who have appropriate certification are likely to be reallocated to teach additional sections of required courses as demand increases. For example, should an additional class of the required course Algebra II be needed, a teacher of a nonrequired course such as Mathematical Models might be reassigned to accommodate the change. Likewise a teacher of an Astronomy class could instead teach the required Physics course, and teachers of higher level of languages could teach Levels I and II. Appendix 6 provides the related nonrequired courses for which possible reallocation of FTEs was considered in this study.

The possible reallocation of FTEs focuses on changes in teacher assignment from one course to the other and on the issue of teacher certification for the specific assignment. A teacher needed for a required algebra course may be certified in another area and not certified in the new assignment such as algebra. Table 4 provides scenarios depending on a certain percentage of teachers being reassigned from one class to the classes required under the Recommended High School Program. FTES in related nonrequired courses include teachers whose areas of certification would allow them to teach in the required courses with their current certification.

For example, Table 4 shows that 117,170 additional students would need to take Algebra II under the increased requirements. Scenario 1 shows that 1,585 FTEs were assigned to teach the course in Fall 1999-2000. These FTEs are assumed to be certified individuals or those who hold permits to teach algebra. There are 653 FTEs teaching related nonrequired high school mathematics courses. This scenario assumes that 100% of the 653 teachers could and would be reassigned to teach Algebra II. With this reassignment of teachers, the estimated total number of FTEs available to meet the demand to teach Algebra II is 2,238 (the sum of FTEs assigned in the fall and the reallocated FTEs). Given the estimate of 2,750 teachers needed to meet demand, there would be a shortage of 512 teachers for Algebra II.

With all FTEs in related nonrequired courses reassigned in the sciences, the shortage of IPC teachers is estimated to be 642 and of Chemistry or Physics teachers to be 497 for a total deficit of 1,139 FTEs. If all students chose to take Chemistry and Physics and not take IPC (as they are encouraged to do in the Recommended High School Program), the estimated shortage of science teachers would still be 1,139 because the IPC teachers could be reassigned to teach either Chemistry or Physics.

Table 4. Analysis of Additional Demand for Teaching Staff
If the Recommended High School Program is Mandatory

	MATHEMATICS	SCIENCES			LANGUAGES						TOTAL
	Algebra II	IPC	Chemistry	Physics	Spanish I	French I	German I	Spanish II	French II	German II	
Students Completing 1999-2000	182,830	222,318	155,636	67,663	153,791	24,872	7,169	141,776	19,612	5,417	
Assumed Annual Completions Needed	300,000	300,000	300,000			300,000			300,000		
Increased Annual Students per Course Area	117,170	77,682	76,701			114,168			133,195		518,916
SCENARIO 1 - All Related Nonrequired Courses Curtailed - 100% Reallocation of FTEs											
FTEs assigned to courses Fall 1999-2000	1,585	1,967	1,472	640	1,492	257	81	1,106	169	52	
FTEs in related nonrequired courses	653	141	141		255	45	19	254	44	18	
Est. Total FTEs available to meet demand	2,238	2,108	2,253		1,747	302	100	1,360	213	70	
Estimated FTEs needed to meet demand	2,750	2,750	2,750			2,750			2,750		
Estimated (Shortage) of FTEs	(512)	(642)	(497)			(601)			(1,107)		(3,359)
SCENARIO 2 - 50% Reallocation of FTEs Teaching Nonrequired Courses											
FTEs assigned to courses Fall 1999-2000	1,585	1,967	1,472	640	1,492	257	81	1,106	169	52	
FTEs in related nonrequired courses	327	71	71		127	22	9	127	22	9	
Est. Total FTEs available to meet demand	1,912	2,038	2,183		1,619	279	90	1,233	191	61	
Estimated FTEs needed to meet demand	2,750	2,750	2,750			2,750			2,750		
Estimated (Shortage) of FTEs	(838)	(712)	(567)			(762)			(1,265)		(4,144)
SCENARIO 3 - 25% Reallocation of FTEs Teaching Nonrequired Courses											
FTEs assigned to courses Fall 1999-2000	1,585	1,967	1,472	640	1,492	257	81	1,106	169	52	
FTEs in related nonrequired courses	163	35	35		64	11	5	64	11	5	
Est. Total FTEs available to meet demand	1,748	2,002	2,147		1,556	268	86	1,170	180	57	
Estimated FTEs needed to meet demand	2,750	2,750	2,750			2,750			2,750		
Estimated (Shortage) of FTEs	(1,002)	(748)	(603)			(840)			(1,343)		(4,536)
SCENARIO 4 - No Related Nonrequired Courses Curtailed - 0% Reallocation of FTEs											
FTEs assigned to courses Fall 1999-2000	1,585	1,967	1,472	640	1,492	257	81	1,106	169	52	
FTEs in related nonrequired courses	0	0	0		0	0	0	0	0	0	
Est. Total FTEs available to meet demand	1,585	1,967	2,112		1,492	257	81	1,106	169	52	
Estimated FTEs needed to meet demand	2,750	2,750	2,750			2,750			2,750		
Estimated (Shortage) of FTEs	(1,165)	(783)	(638)			(920)			(1,423)		(4,929)

Assumptions and related notes for this analysis can be found in Appendix 5.

Overall, if all teachers of related nonrequired courses were reallocated, there would be shortage of 3,359 teachers across the three major subject areas of mathematics, sciences, and languages other than English.

If half of the individuals teaching related nonrequired courses could be reallocated as shown in Scenario 2, there would be a shortage of 838 teachers for Algebra II. In the sciences the estimated shortage of teachers is 1,279 teachers. With 50% reallocation of FTEs, the shortage of Levels I and II language teachers is 2,027. A total shortage of approximately 4,144 FTEs would occur for the three areas examined in this study.

Scenario 4 depicts the data if FTEs in related nonrequired courses cannot be reallocated. Assuming that no reallocation of FTEs can occur, it is estimated that 1,165 additional mathematics teachers, 1421 science teachers, 920 teachers of languages other than English, Level I and 1,423 teachers of languages other than English, Level II would be needed. Approximately 4,929 FTEs would be needed in total.

Projected Need for Teachers in Specific Subject Areas: A&M Survey

Additional information was gathered about estimated numbers of teachers needed if the Recommended High School Program is the mandated minimum requirement for a diploma. At the request of TEA and SBEC, the Institute for School-University Partnerships, Texas A&M System, collected data in its Teacher Demand Survey related to this issue. The survey, distributed to all school districts in Fall 2000, included questions asking districts about the number of teachers they would need in the areas of languages other than English and science should the Recommended High School Program be mandated as the minimum plan for all students. Appendix 7 lists the specific questions asked in the survey.

Districts projected that they would need an additional 1,530 certified teachers of languages other than English and an additional 1,496 certified science teachers should the Recommended High School Program become the minimum. These data look only at numbers of certified teachers needed and do not take into account any possible reallocation of teachers based on the different course requirements.

Cost Estimates

Using total reallocation and zero reallocation of FTEs in related nonrequired courses provides an estimated range of salary costs associated with the additional staff requirements. With 100% reallocation of teachers, an additional 3,359 teachers would be necessary at an approximate cost of $140,000,000 annually. If no reallocation of teachers could take place, 4,929 teachers would be needed at an approximate annual cost of $200,000,000. These amounts are rounded up to accommodate some of the increased benefits costs. Average salary is assumed to be about $37,840 based on 1999-2000 salary data reported in PEIMS for individuals classified as teachers and special duty teachers. These cost estimates do not include any possible offsetting savings that might be realized if districts discontinue nonrequired (elective) courses in order to reassign certified personnel to teach required courses.

Increased ongoing cost would also be associated with supervision and professional development for the additional teaching positions. Cost estimates for these activities are not provided but would need to be considered should the Recommended High School Program become the minimum graduation

requirement for students. Professional development could be targeted for noncertified teachers to become certified and for certified teachers to be retrained in required areas.

There are also facilities costs associated with requiring the Recommended High School Program as the minimum program. If all classrooms from related nonrequired courses could be reallocated, approximately 3,359 classrooms would still be necessary. If no classrooms were available for reallocation, about 4,929 classrooms would be required in addition to those in current facilities statewide. Estimated one-time costs for the additional classrooms range from $400,000,000 to $740,000,000. These estimates are based on an average cost per classroom ranging from $120,000 to $150,000, using $100 per square foot construction costs and an average size of 1,200 square feet. Classroom equipment costs would vary considerably with costs being the highest for science laboratories. Classroom construction would likely be financed through long-term debt issuance.

In addition, requiring the Recommended High School Program has implications for the cost of textbooks and instructional materials. The increased number of students for the three areas used in this study is 518,916 annually. Assuming an average cost per textbook of about $60, the associated one-time increase in textbook costs is estimated to be $31,000,000. This cost represents a one-time increase over the implementation period. Costs are not considered to be periodic (with each new adoption) because of an anticipated offsetting decline in the demand for textbooks for elective courses as students enroll in the additional required courses.

Available and Projected Certified Teachers: Methodology

Texas has experienced a growing shortage of certified teachers, particularly in the foundation curriculum areas, over the last three years. The state's current production of newly certified teachers has not been able to keep up with the growing needs of the school districts as evidenced by the increasing number of individuals serving on permits. In order to estimate the impact on the current teacher shortage caused by moving to the Recommended High School Program as the required minimum, a database for 1994 through 1999 was developed to include the number of newly certified teachers produced each year, the employment history of these new teachers, and attrition rates for these teachers.

The state's annual production numbers were compiled into two categories: all newly certified teachers and all newly certified teachers in the areas of mathematics, sciences, and the three languages other than English examined in this study. Production numbers were also projected to account for newly created teacher certification programs and the expansion of existing programs.

The cohort of each year's newly certified teachers was examined to see how many were employed in Texas schools the following year. Each cohort was then tracked for a period of three to five years to determine employment history as well as the overall employment history of all Texas teachers.

Production, Employment, and Attrition

During the period 1994 through 1999, the state produced an average of 15,061 newly certified teachers each year. The number of newly certified teachers ranged from a low of 14,330 to a high of 16,090. Although the production figures fluctuate each year, overall there has been an average annual growth rate of 2.02%.

Texas school districts also recruit teachers from other states. During the same period of 1994 through 1999, 3,515 out-of-state teachers received Texas certification annually. The average annual

production of newly certified teachers and teachers recruited from other states in the projected areas of most need is shown in Table 5. These data reveal that in several critical areas of shortage, almost as many new teachers were recruited from out of state as were produced in Texas.

Table 5. Average In-State Production and Out-of-State Recruitment: 1994-1999

Content Areas	In-State Programs	Out-of-State Teachers	Total
Mathematics	633	212	845
Physics	26	23	49
Physical Science	58	32	90
Chemistry	65	47	112
Science Composite	196	113	309
Spanish	187	102	289
French	27	27	54
German	14	10	24
Total	1,206	566	1,772

Of each year's supply of newly certified teachers, approximately 66% actually entered Texas classrooms the following school year. This figure climbs to 75% when the employment history covering the following 3 years is added to those hired the year following certification. In other words, 75% of newly certified teachers will eventually teach at least 1 year within 4 years after being certified.

Of this group of newly certified and hired teachers, 9% left the profession after the first year. Another 7% left after the second year and 6% after the third year of teaching. After the fourth year, an additional 6% left teaching. The attrition of these newly certified teachers contributes to the overall 10% attrition of Texas teachers each year from the profession.

Employed Teachers Who Are Uncertified

School year 1998-1999 is used as an example to illustrate the shortage of teachers compared to supply. After school districts had completed hiring the available newly certified teachers and recruited teachers from other states, districts still had to request from SBEC a large number of permits for uncertified individuals. For grades 9 through 12 mathematics, school districts requested permits for 847 teachers. In the sciences, 420 permits were necessary and in languages other than English, 443 permits were needed. Persons serving on permits do not hold the certificate required for that assignment but are required to receive training and become certified within three years.

The total number of individuals issued permits each year has grown from 7,591 in school year 1994-1995 to 12,228 in school year 1998-1999. This growth trend has continued with the number of permits issued reaching more than 13,000 in school year 1999-2000. By content area, the number of permits in mathematics has grown from 539 to 847, in the sciences from 235 to 420, and in languages other than English from 230 to 443.

The magnitude of the effort Texas must make to address the current shortage of mathematics, science, and language teachers is evident. Based on the number of permits in school year 1998-99 and a hiring rate of 66% of newly certified teachers, Texas would have to prepare an additional 1,283

mathematics teachers, 636 science teachers, and 671 language teachers to fill the classrooms taught by individuals on permit in school year 1998-1999.

By using the actual production numbers of newly certified teachers from 1997-1998 who were potentially available for employment in 1998-1999, the magnitude of this shortage can be viewed another way as shown in Table 6. Instead of producing 572 mathematics teachers in 1997-1998, the state needed to produce 1,855 mathematics teachers. The state needed to produce 1,007 science teachers in 1997-1998 in lieu of producing 371 science teachers. Likewise, instead of producing 264 teachers of languages other than English in 1998, the state needed to produce 935 such teachers. These numbers indicate that the state must triple its annual production of newly certified teachers simply to meet the current teacher shortage as represented by the number of individuals serving on permits.

Table 6. Actual Production Compared to Production Need: 1997-1998

Content Area	Actual Production	Needed Production
Mathematics	572	1,855
Science	371	1,007
Languages	264	935

Projected Production Needed

The projected teacher shortage that would result from moving to the Recommended High School Program as the minimum is based on the following assumptions:

- The state will expand its capacity to produce newly certified teachers to meet the current teacher shortage.
- The certification program growth rate will remain constant.
- The hiring rate or percentage of newly certified teachers will remain constant.
- The attrition of newly hired teachers and of all teachers will remain constant.

Table 7 shows the numbers of newly certified teachers needed each year over a two-year period to meet the state's needs plus provide additional teachers to implement the Recommended High School Program as the minimum plan. Assuming a two-year window to meet the additional needs, these figures are higher than the estimated shortages in the respective scenarios because the state typically hires only two-thirds of each year's newly certified teachers.

Table 7. Annual Projected Production of Teachers for a Mandatory Recommended High School Program

Current Need		Additional Need: Scenario 1	Additional Need: Scenario 4	Yearly Need	
				Scenario 1	Scenario 4
Mathematics	1,855	388	883	2,243	2,738
Sciences	1,007	864	1,077	1,871	2,084
Languages	935	1,294	1,775	2,229	2,710

Efforts to Address Shortages

The 74th Texas Legislature passed the school district teaching permit provisions into law. These provisions allow school districts to request a district teaching permit for classroom teaching assignments and employ as teachers individuals who do not hold teaching certificates. These individual must have baccalaureate degrees and relevant work experience. All requests for these permits are submitted to TEA for approval by the commissioner. Since July 1995 approximately 1,800 permits have been approved. In 1999-2000 approximately 120 school district teaching permits were approved in the areas of secondary mathematics, sciences, and languages other than English.

Other endeavors have occurred or are under way to increase the state's capacity to prepare and retain new teachers.

- The TXBESS project was created to support new teachers by providing instructional classroom management expertise to enhance their probability of success.
- SBEC's Teacher Shortage Initiative grants have funded eight entities to develop new or expand existing teacher certification programs. These entities will add approximately 400 new teachers each year by school year 2002-2003. Of these, approximately 100 are science teachers and 60 are mathematics teachers.
- Distance learning opportunities are being created.
- The Texas A&M Regents Initiative has set as their target goal to increase the A&M System's teacher certification production by 33% by school year 2003-2004.
- The University of Texas at Austin has undertaken an effort called UTEACH to increase the number of science teachers prepared each year by that institution.
- The Teach for Texas Grants were established in the last biennium, which forgive loans if persons enter and stay in the profession up to five years.
- Amendments to SBEC rules have been adopted that open doors to other entities, e.g., community colleges and private-sector groups, to prepare teachers.

Although these initiatives are critical to addressing Texas' teacher shortage, they serve only to help maintain the status quo, not to curtail the shortage. The new teachers produced will help meet the state's annual growth and need for more teachers but will not significantly reduce the number of individuals serving each year on permits.

Texas Beginning Educator Support System (TxBESS)

Studies have shown that support for beginning teachers leads to increased retention rates and thus a reduction in the current teacher shortage. The TxBESS pilot program was begun in fall 1999 with a $10 million, 3-year Teacher Quality Enhancement Grant from the U.S. Department of Education. In school year 2000-2001 approximately 2,500 new teachers are being mentored by trained, experienced teachers at a cost of about $3000 each. Instead of a "sink or swim" approach, TxBESS offers the beginning teacher a life preserver in the form of a support team. The support team consists of a mentor who is an experienced teacher, a district administrator, and a person outside the district—either an education service center specialist or an educator preparation staff person.

TxBESS program standards were developed by practitioners to give guidance to individual districts and regional education service centers who are initiating programs. Performance standards were also developed by practitioners to guide novice teachers and help their mentors in focusing on

improvement efforts. These standards are valuable for veterans, as well as novices, in arriving at a shared understanding of teaching and a common language for professional discourse. Articulating clear standards in a comprehensive framework of professional practice that reflects many different aspects of teaching enhances the quality of work and the sense of purpose for beginning teachers.

The standards were used to develop a formative assessment process to guide the beginning teacher through the first year in the classroom. TxBESS is continuing to grow. Pending legislative funding, TxBESS is geared to provide support and mentoring to one-third of the state's beginning teachers by the 2002-2003 academic year.

Distance Learning and Dual Credit

Distance learning may be one strategy that could help offset some of the shortages of certified teachers if a change in the graduation requirements takes place. Distance learning offers additional opportunities for high school students to take courses not available at their campus. Advances in technologies now make distance learning available through a combination of satellite, videoconferencing, instructional television, and the Internet. Many Texas campuses have access to some or all of these technologies, and others are planning such access. As shown in Appendix 8, in Texas 383 students received credit for courses in mathematics, science, and languages using some form of distance learning in 1999-2000.

In addition, coursework and professional development targeted for noncertified teachers to become certified and for retraining certified teachers are increasingly offered via distance learning. A wide variety of programs are available from satellite providers nationwide. Currently, however, there are no data that can be used to predict how prevalent distance learning might become as a means of providing high school students access to courses or of overcoming teacher shortages.

Dual credit can also provide courses that might otherwise be unavailable or for which a shortage of certified teachers exists. A school district board of trustees may adopt a policy that allows students to receive credit toward high school graduation for completing a college-level course. The course for which credit is awarded must provide advanced academic instruction beyond or in greater depth than that required by the state curriculum for the high school course. In 1999-2000 dual, or concurrent, credit was earned by 5,735 students for the courses in mathematics, science, and languages examined in this study. Appendix 9 provides additional detail on the dual credit earned.

Other Significant Issues Related to this Study

This study attempts to provide some data on the extent of shortages of certified teachers that could occur if the Recommended High School Program replaces the minimum graduation plan. The reallocation scenarios provide various ways of quantifying possible shortages in the areas of mathematics, science, and languages other than English. Another issue to consider, however, is the effect of reassigning certified teachers from related nonrequired courses. Potentially, shortages would then occur for those courses, including higher-level language classes, which are part of the Distinguished Achievement Program.

Reallocation of other properly certified staff is also a possibility. For example, many computer science teachers are also mathematics teachers. Reassignment of these to additional mathematics classes, however, could have a significant effect on the ability of districts to offer computer science courses.

Another critical issue concerns the disparate impact that may occur among the more than one thousand school districts in Texas. The analysis in this study is a broad-brush picture, focusing on statewide data. The impact of requiring the Recommended High School Program could vary significantly from district to district because circumstances in the districts, even those of similar size or locale, may be widely dissimilar.

This study centers on possible shortages of certified personnel in only mathematics, science, and languages. This focus should not imply that shortages of credentialed teachers would not occur in other areas. Recruitment and retention of qualified educators are critical in other areas as well.

Strategies to Address Teacher Need

In its plan for higher education *Closing the Gaps, by 2015*, The Texas Higher Education Coordinating Board calls for the Recommended High School Program as the minimum requirement for admission to Texas public universities by 2008. This particular timeline would affect high school students who begin ninth grade in 2004-2005. Such a requirement, however, cannot be implemented successfully without significant additional resources. The following approaches are suggested to minimize short-term consequences of teacher shortages and maximize long-term effects of mandating the Recommended High School Program for students to receive a Texas high school diploma and subsequently to enter a Texas university.

- Provide for greater access to teacher certification training programs and create opportunities for people to advance toward certification based upon their knowledge and skills
- Provide financial incentives to create and expand educator preparation programs, including those at community colleges and school districts
- Fund the Teach for Texas grants for persons in alternative certification programs
- Expand available scholarship programs such as Teach for Texas and create additional financial-aid opportunities to support individuals who want to pursue certification, including those with less severe financial need
- Underwrite systematic teacher-mentoring or induction programs to enable new teachers to transition effectively into their professional assignments in Texas schools
- Provide stipends, extra incentive pay, and/or other types of compensation to master educators who work with new teachers
- Expand the master teacher concept to mathematics and other shortage areas
- Establish incentives for programs to prepare certified teachers to expand their knowledge and skills to be certified in other areas
- Reduce the sit-out period for teacher retirees
- Expand funding for the certified teacher aide tuition exemption program in order to increase program participation
- Include a measure in the accountability system for educator preparation programs that accounts for producing more teachers, particularly in high-need shortage areas

Appendix 1
Course Requirements at the Secondary Level

Texas Administrative Code §74.3(b)(2)

The school district must offer the courses listed in this paragraph and maintain evidence that students have the opportunity to take these courses:

(A) English language arts - English I, II, III, and IV;

(B) mathematics - Algebra I, Algebra II, Geometry, Precalculus, and Mathematical Models with Applications;

(C) science - Integrated Physics and Chemistry, Biology, Chemistry, and Physics. Science courses shall include at least 40% hands-on laboratory investigations and field work using appropriate scientific inquiry;

(D) social studies - United States History Studies Since Reconstruction, World History Studies, United States Government, and World Geography Studies;

(E) Economics with Emphasis on the Free Enterprise System and Its Benefits;

(F) physical education - Foundations of Personal Fitness and at least two courses selected from Adventure/Outdoor Education; Aerobic Activities; Individual Sports; or Team Sports;

(G) health education - Health 1;

(H) fine arts - courses selected from at least two of the four fine arts areas (art, music, theatre, and dance) - Art I, II, III, IV; Music I, II, III, IV; Theatre I, II, III, IV; or Dance I, II, III, IV;

(I) career and technology education - courses selected from at least three of the eight career and technology areas (agricultural science and technology education, business education, career orientation, health science technology education, family and consumer sciences education/ home economics education, technology education/industrial technology education, marketing education, and trade and industrial education) taught on a campus in the school district with provisions for contracting for additional offerings with programs or institutions as may be practical;

(J) languages other than English - Levels I, II, and III of the same language;

(K) technology applications - at least four courses selected from Computer Science I, Computer Science II, Desktop Publishing, Digital Graphics/Animation, Multimedia, Video Technology, Web Mastering, or Independent Study in Technology Applications;

(L) speech - Communication Applications.

Appendix 2
Texas State Graduation Requirements
(For students entering grade 9 in the 2001-02 school year and thereafter)

Discipline	Minimum Graduation Plan (22 credits)	Recommended High School Program (24 credits)	Distinguished Achievement Program (24 credits plus advanced measures)

English Language Arts*	**Four credits**:
	• English I, II, and III.
	• English I and II for Speakers of Other Languages may be substituted for English I and II only for immigrant students with limited English proficiency.
	• The fourth credit of English may be satisfied from:
	  • English IV,
	  • Research/Technical Writing,
	  • Creative/Imaginative Writing,
	  • Practical Writing Skills,
	  • Literary Genres,
	  • Business Communication,
	  • Journalism, or
	  • Concurrent enrollment in a college English course.
		Four credits:
		• English I, II, III, and IV.
		• English I and II for Speakers of Other Languages may be substituted for English I and II only for immigrant students with limited English proficiency.
			Four credits:
			• English I, II, III, and IV.
			• English I and II for Speakers of Other Languages may be substituted for English I and II only for immigrant students with limited English proficiency.

Mathematics*	**Three credits** to include: • Algebra I and • Geometry.	**Three credits**: • Algebra I, • Algebra II, and • Geometry.	**Three credits**: • Algebra I, • Algebra II, and • Geometry.
Science*	**Two credits** to include: • Biology and • Integrated Physics and Chemistry. May substitute Chemistry or Physics for IPC but must use one of these as the academic elective credit.	**Three credits**: **One credit** from Biology, AP Biology, or IB Biology; and **Two credits** from the following areas, with no more than one credit chosen from each of the areas: • Integrated Physics and Chemistry; • Chemistry, AP Chemistry, or IB Chemistry; or • Physics, Principles of Technology I, AP Physics, or IB Physics. Students are encouraged to take courses in biology, chemistry, and physics.	**Three credits**: **One credit** from Biology, AP Biology, or IB Biology; and **Two credits** from the following areas, with no more than one credit chosen from each of the areas: • Integrated Physics and Chemistry; • Chemistry, AP Chemistry, or IB Chemistry; or • Physics, Principles of Technology I, AP Physics, or IB Physics. Students are encouraged to take courses in biology, chemistry, and physics.

*College Board Advanced Placement and International Baccalaureate courses may be substituted for requirements in appropriate areas.

BEST COPY AVAILABLE

Texas State Graduation Requirements (continued)

(For students entering grade 9 in the 2001-02 school year and thereafter)

Discipline	Minimum Graduation Plan (22 credits)	Recommended High School Program (24 credits)	Distinguished Achievement Program (24 credits plus advanced measures)
Social Studies*	**Two and one-half credits**: • World History Studies (one credit) or World Geography Studies (one credit), • U.S. History Studies Since Reconstruction (one credit), and • U.S. Government (one-half credit).	**Three and one-half credits**: • World History Studies (one credit), • World Geography Studies (one credit), • U.S. History Studies Since Reconstruction (one credit), and • U.S. Government (one-half credit).	**Three and one-half credits**: • World History Studies (one credit), • World Geography Studies (one credit), • U.S. History Studies Since Reconstruction (one credit), and • U.S. Government (one-half credit).
Economics, with emphasis on the free enterprise system and its benefits*	**One-half credit**	**One-half credit**	**One-half credit**
Academic Elective	**One credit** selected from: • World History Studies, • World Geography Studies, or • any science course approved by SBOE. (If substituting Chemistry or Physics for IPC, must use one of these as the academic elective credit.)	**See Elective Courses.**	**See Elective Courses.**
Physical Education	**One and one-half credits** to include Foundations of Personal Fitness (one-half credit). (Limit two credits.) Can substitute: • drill team, • marching band, • cheerleading, • Junior Reserve Officer Training Corps (JROTC), • athletics, • Dance I-IV, • approved private programs, or • certain career and technology education courses.	**One and one-half credits** to include Foundations of Personal Fitness (one-half credit). (Limit two credits.) Can substitute: • drill team, • marching band, • cheerleading, • JROTC, • athletics, • Dance I-IV, • approved private programs, or • certain career and technology education courses.	**One and one-half credits** to include Foundations of Personal Fitness (one-half credit). (Limit two credits.) Can substitute: • drill team, • marching band, • cheerleading, • JROTC, • athletics, • Dance I-IV, • approved private programs, or • certain career and technology education courses.
Languages Other Than English*	**None**	**Two credits**: Level I and Level II in the same language.	**Three credits**: Level I, Level II, and Level III in the same language.
Health Education	**One-half credit** or Health Science Technology (one credit).	**One-half credit** or Health Science Technology (one credit).	**One-half credit** or Health Science Technology (one credit).

*College Board Advanced Placement and International Baccalaureate courses may be substituted for requirements in appropriate areas.

Texas State Graduation Requirements (continued)

(For students entering grade 9 in the 2001-02 school year and thereafter)

Discipline	Minimum Graduation Plan (22 credits)	Recommended High School Program (24 credits)	Distinguished Achievement Program (24 credits plus advanced measures)
Technology Applications*	**One credit** from: • Computer Science I or II, • Desktop Publishing, • Digital Graphics/Animation, • Multimedia, • Video Technology, • Web Mastering, • Independent Study in Technology Applications, • Business Computer Information Systems I or II, • Business Computer Programming, • Telecommunications and Networking, • Business Image Management and Multimedia, • Computer Applications, • Technology Systems (modular computer laboratory-based), • Communication Graphics (modular computer laboratory-based), or • Computer Multimedia and Animation Technology.	**One credit** from: • Computer Science I or II, • Desktop Publishing, • Digital Graphics/Animation, • Multimedia, • Video Technology, • Web Mastering, • Independent Study in Technology Applications, • Business Computer Information Systems I or II, • Business Computer Programming, • Telecommunications and Networking, • Business Image Management and Multimedia, • Computer Applications, • Technology Systems (modular computer laboratory-based), • Communication Graphics (modular computer laboratory-based), or • Computer Multimedia and Animation Technology.	**One credit** from: • Computer Science I or II, • Desktop Publishing, • Digital Graphics/Animation, • Multimedia, • Video Technology, • Web Mastering, • Independent Study in Technology Applications, • Business Computer Information Systems I or II, • Business Computer Programming, • Telecommunications and Networking, • Business Image Management and Multimedia, • Computer Applications, • Technology Systems (modular computer laboratory-based), • Communication Graphics (modular computer laboratory-based), or • Computer Multimedia and Animation Technology.
Fine Arts*	**None**	**One credit** from: any course in 19 TAC Chapter 117 (relating to high school fine arts Essential Knowledge and Skills).	**One credit** from: any course in 19 TAC Chapter 117 (relating to high school fine arts Essential Knowledge and Skills).
Speech	**One-half credit:** • Communication Applications	**One-half credit:** • Communication Applications	**One-half credit:** • Communication Applications
Elective Courses*	**Five and one-half credits** from: • the list of courses approved by the SBOE for Grades 9-12 (relating to Essential Knowledge and Skills), • state-approved innovative courses, • JROTC (one to four credits), or • Driver Education (one-half credit).	**Three and one-half credits** from: • the list of courses approved by the SBOE for Grades 9-12 (relating to Essential Knowledge and Skills), • state-approved innovative courses, • JROTC (one to four credits), or • Driver Education (one-half credit). Students are encouraged to take courses in English language arts, mathematics, science, and social studies every year in high school.	**Two and one-half credits** from: • the list of courses approved by the SBOE for Grades 9-12 (relating to Essential Knowledge and Skills), • state-approved innovative courses, • JROTC (one to four credits), or • Driver Education (one-half credit). Students are encouraged to take courses in English language arts, mathematics, science, and social studies every year in high school.

*College Board Advanced Placement and International Baccalaureate courses may be substituted for requirements in appropriate areas.

Texas State Graduation Requirements (continued)

(For students entering grade 9 in the 2001-02 school year and thereafter)

Discipline	Minimum Graduation Plan (22 credits)	Recommended High School Program (24 credits)	Distinguished Achievement Program (24 credits plus advanced measures)
Advanced Measures	None	None	• The measures must focus on demonstrated student performance at the college or professional level. • Student performance on advanced measures must be assessed through an external review process. • A student must achieve any combination of **four** of the following: **Original research/project**: • judged by a panel of professionals in the field that is the focus of the project; or • conducted under the direction of mentor(s) and reported to an appropriate audience; and • related to the required curriculum set forth in 19 TAC §74.1 (relating to Essential Knowledge and Skills). • may not be used for more than two of the four advanced measures. **Test data**: • a score of three or above on The College Board Advanced Placement examination; • a score of four or above on an International Baccalaureate examination; • a score on the Preliminary Scholastic Assessment Test (PSAT) that qualifies a student for recognition as a Commended Scholar or higher by the National Merit Scholarship Corporation, as part of the National Hispanic Scholar Program of The College Board, or as part of the National Achievement Scholarship Program for Outstanding Negro Students of the National Merit Scholarship Corporation. The PSAT score may count as only one advanced measure regardless of the number of honors received by the student. **College courses**: • a grade of 3.0 or higher on courses that count for college credit, including tech-prep programs.

BEST COPY AVAILABLE

Appendix 3

Campuses Not Offering the Recommended High School Program 1999-2000

	Campus	District
ALTERNATIVE CAMPUSES		
	A I M S Center HS	Vidor ISD
	Barbara Mann HS	Dallas ISD
	Challenger HS	Lampasas ISD
	Chip Richarte Learning Center	Georgetown ISD
	Cisco Learning Center	Cisco ISD
	Co-op Alternative Program	Coleman ISD
	Contemporary Learning Center HS	Houston ISD
	Decatur Learning Center	Decatur ISD
	Hill Country HS	Kerrville ISD
	Hope HS	Calhoun County ISD
	Kay On-Going Education Center	Houston ISD
	Keys Center	Hurst-Euless-Bedford ISD
	Mary Grett Center	Corpus Christi ISD
	McGregor Preparatory HS	McGregor ISD
	Pride School	Lockhart ISD
	Quest	Burnet Consolidated ISD
	Reach HS	Castleberry ISD
	Schleicher County ISD AEP Center	Schleicher ISD
	Stubblefield Learning Center	Hudson ISD
	The L I N C Center	McKinney ISD
REGULAR CAMPUSES[1]		
	Texas Tech HS	Texas Tech University HS

[1]Updated 10/2000 for school year 2000-2001

Appendix 4

Number of Students Completing Course in 1999-2000

Course Name	Students Completing
Algebra II	182,830
Integrated Physics/Chemistry	222,318
Chemistry	155,636
Physics	67,663
Spanish I	153,791
Spanish II	141,776
French I	24,872
French II	19,612
German I	7,169
German II	5,417

Number of Students Completing Course by Grade Level in 1999-2000

Course Name	Grade	Students Completing	Percent
Algebra II	9	9,205	5%
Algebra II	10	58,799	32%
Algebra II	11	88,876	49%
Algebra II	12	25,950	14%
Integrated Physics/Chemistry	9	141,240	64%
Integrated Physics/Chemistry	10	60,752	27%
Integrated Physics/Chemistry	11	13,897	6%
Integrated Physics/Chemistry	12	6,429	3%
Chemistry	9	1,558	1%
Chemistry	10	63,171	41%
Chemistry	11	72,677	47%
Chemistry	12	18,230	12%
Physics	9	317	0.5%
Physics	10	1,892	3%
Physics	11	38,395	57%
Physics	12	27,059	40%
Spanish I	9	82,159	53%
Spanish I	10	49,422	32%
Spanish I	11	18,453	12%
Spanish I	12	3,757	2%
Spanish II	9	38,326	27%
Spanish II	10	54,719	39%
Spanish II	11	36,459	26%
Spanish II	12	12,272	9%
French I	9	13,667	55%
French I	10	7,532	30%
French I	11	2,959	12%
French I	12	714	3%
French II	9	3,365	17%
French II	10	9,291	47%
French II	11	5,182	26%
French II	12	1,774	9%
German I	9	3,586	50%
German I	10	2,421	34%
German I	11	961	13%
German I	12	201	3%
German II	9	592	11%
German II	10	2,457	45%
German II	11	1,795	33%
German II	12	573	11%

Appendix 5
Assumptions and Related Notes
For the Analysis of Additional Demand for Teaching Staff in Table 4

- Course enrollment in selected courses is relatively stable across years.
- The earliest possible implementation could begin with students entering 9th grade in 2002-2003 (6th grade in 1999-2000).
- Relative cohort size of about 300,000 students per year was used (based on a multi-year comparison of growth in 6th-grade enrollments to corresponding 10th- and 11th-grade enrollments of the same population).
- An average class size of 20 students was used -- discounted to recognize inefficiencies of size in small districts. Analysis indicates class sizes range from about 13 students per section in small districts (fewer than 500 students) to about 25 students per section in the state's largest districts (more than 50,000 students).
- An average teaching load of 5.5 sections per day per FTE was assumed, which accommodates varying district practices of 5 or 6 periods per day and various block scheduling practices.
- The relative number of FTEs needed to serve a cohort of 300,000 students per subject per year was assumed to be 2,750. [300,000 (cohort) divided by 20 (class size) divided by 5.5 (periods) = 2,727, rounded up to 2,750]
- No Precalculus FTEs were reallocated under any scenario.
- The number of FTEs teaching related nonrequired science courses has been discounted to exclude teachers who are not adequately certified to teach Chemistry, Physics, and IPC.
- FTEs assigned/teaching courses listed are assumed to be certified or permitted to teach those courses.
- Students would take IPC and either Chemistry or Physics to meet requirements, or students would take Chemistry and Physics and avoid IPC (presumes FTEs teaching IPC would be diverted to teach Chemistry and Physics classes).
- A stable teaching cadre for these subjects is assumed with no unusual turnover or retirement patterns.
- Data from courses designated as magnet or innovative courses were not included.

Appendix 6
Related Nonrequired Courses

Fall 1999-2000

	Course
MATHEMATICS	Mathematical Models with Application
	Mathematics Independent Study
SCIENCES	Environmental Systems[1]
	Aquatic Science[1]
	Geology, Meteorology, Oceanography
	Astronomy
	Scientific Research and Design I, II, and III
	Anatomy and Physiology of Human Systems
	Medical Microbiology
	Pathophysiology
	Principles of Technology II
LANGUAGES	
SPANISH	Spanish III, IV, V, VI, and VII
	Spanish Culture and Linguistics
FRENCH	French III, IV, V, VI, and VII
	French Culture and Linguistics
GERMAN	German III, IV, V, VI, and VII
	German Culture and Linguistics

[1] Based on a match to SBEC data for appropriate certification, very few teachers of this course were included in the possible reallocation.

Appendix 7
Excerpt from Regional Teacher Supply and Demand Study, 1999-2000
The Institute for School-University Partnerships,
Texas A&M System

The two questions below refer to the *Recommended High School* curriculum and request an unduplicated count of *individuals*, not an FTE count.

If all the students in your district were required to complete the Recommended High School curriculum for **science**, how many additional certified science teachers would you need to hire?

Include only IPC, Physics and Chemistry.

If all the students in your district were required to complete the Recommended High School curriculum for **foreign language**, how many additional certified foreign language teachers would you need to hire?

Level I and II of the same language.

Assume that the foreign languages currently taught in your district remain the same.

Appendix 8
Course Completions Through Distance Learning
PEIMS, 1999-2000

Course Name	Distance Learning Description	Number of Students Completing Course
Algebra II	Internet	1
Algebra II	Videoconferencing and Internet	2
Integrated Chemistry/Physics	Internet	1
Chemistry	Other	13
AP Physics	Satellite	1
Physics	Videoconferencing	14
Physics	Satellite and Internet	1
Spanish I	Satellite	81
Spanish I	Instructional TV Fixed Service	2
Spanish I	Videoconferencing	37
Spanish I	Internet	2
Spanish I	Other	2
Spanish II	Satellite	63
Spanish II	Instructional TV Fixed Service	4
Spanish II	Videoconferencing	53
Spanish II	Internet	1
French I	Satellite	17
French I	Instructional TV Fixed Service	2
French II	Satellite	21
French II	Instructional TV Fixed Service	3
French II	Videoconferencing	1
German I	Satellite	3
German I	Instructional TV Fixed Service	2
German I	Videoconferencing	13
German I	Other	2
German II	Satellite	1
German II	Internet	1
German II	Videoconferencing and Internet	38
German II	Satellite and Internet	1
	Total	383

Appendix 9
Course Completions Through Dual Credit
PEIMS, 1999-2000

Course Name	Grade	Students Completing
Algebra II	9	96
Algebra II	10	868
Algebra II	11	1,530
Algebra II	12	518
Integrated Physics/Chemistry	9	12
Integrated Physics/Chemistry	10	87
Integrated Physics/Chemistry	11	18
Integrated Physics/Chemistry	12	10
Chemistry	9	2
Chemistry	10	101
Chemistry	11	237
Chemistry	12	175
AP Physics	11	1
AP Physics	12	62
Physics	11	157
Physics	12	110
Spanish I	9	320
Spanish I	10	74
Spanish I	11	85
Spanish I	12	33
Spanish II	9	132
Spanish II	10	63
Spanish II	11	117
Spanish II	12	61
French I	9	202
French I	10	118
French I	11	50
French I	12	16
French II	9	166
French II	10	175
French II	11	95
French II	12	29
German I	9	2
German I	10	6
German II	11	5
German II	12	2
	Total	5,735

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, *or*, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
~~1100 West Street, 2nd Floor~~
~~Laurel, Maryland 20707-3598~~ Lanham MD

Telephone: 301-497-4080
Toll Free: 800-799-3742
FAX: 301-953-0263
e-mail: ericfac@inet.ed.gov
WWW: http://ericfac.piccard.csc.com

EFF-088 (Rev. 9/97)
PREVIOUS VERSIONS OF THIS FORM ARE OBSOLETE.